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KEY ROLES IN DRIVING SUSTAINABILITY PRACTICE INTO THE BUILT ENVIRONMENT

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ABSTRACT

Sustainability has been highly promoted in the construction industry. However, the adoption of sustainability practice has not gained the momentum yet. Sustainability is not only a technical pursuit but also a dialogue of values. It requires collective vision, multiple efforts, dynamic participation and governance of multi-disciplinary stakeholders. Different stakeholders exert various degrees of influences in determining the extent of sustainability implementation in built environment. The purpose of this paper is to determine which stakeholders have greater influences in driving sustainability in built environment. This paper reviews relevant literature and examines the stakeholders' roles in driving effective implementation of sustainable practice in construction. Interviews were carried out with various stakeholders including developers, contractors, surveyors, architects, landscape architect, urban designer, engineers and facilities manager. The result shows that each stakeholder has his/her roles in bringing impacts on sustainability practice, with varying degrees. Although there are disparities in the opinions of stakeholders, the result suggests that the government and project clients play an extremely important role in the pursuit of sustainability practice. The government can not only lead the industry to pioneer the innovative technologies in relation to sustainability but also introduce sustainability into legislation by enforcing the construction-related laws. Meanwhile, clients create the demand for sustainability since the construction industry is principally client-driven. Stakeholders at the lower echelon of the organisational structure such as contractors and end users are also significant to ensure sustainability is well embedded in the built environment. Being the implementers or users, they could pose challenges which can decelerate progress in the implementation of sustainable construction. The realization of sustainability requires collective vision, multiple efforts, dynamic participation and governance of all stakeholders. Encouraging sustainability behaviour in all the stakeholders is thus the key to transform current practice in the built environment into more sustainable solutions.

Keywords: Sustainability; Built environment; Key roles; Stakeholders

1. INTRODUCTION

The concept of sustainable development has been widely promoted in the construction industry, from low embodied carbon materials to energy efficient equipment, green buildings and sustainable cities. Sustainable development is a holistic approach which emphasizes balanced development between

three key dimensions: environment, economy and society. It emphasizes the delivery of long term development by fulfilling both current and future needs in aspects of ecological preservation, social cohesion and economic gain. To meet the long term development goal, the concept of whole building lifecycle should be taken into considerations, by examining the building performance throughout the processes of inception, design, construction, operation and maintenance. Life cycle consideration has to be incorporated in the building design, construction techniques and management strategy (Sebastian, 2011).

Nonetheless, the quality of the built environment and its contribution to sustainable development rely on decisions and actions of the actors in property and construction markets (Lützkendorf, et al., 2011). Sustainability in the built environment is a multi-disciplinary integration that includes architectural design, interior design, engineering analysis, urban planning, and facilities management. The decisions and interactions of stakeholders would determine the success of the delivery of sustainability in buildings.

In line with it, Cole (2011) also recognised that technological solution or economic arguments based on benefit and governance solutions are inadequate, and organisational interplay amongst and between different stakeholders is a missing catalyst to deliver sustainable change. He urged the need to orchestrate the complex array of stakeholders and to understand each other's particular motivations. It is therefore imperative to evaluate the stakeholder influences, roles and responsibilities appropriately.

2. STAKEHOLDERS IN THE BUILT ENVIRONMENT

2.1 Stakeholders vs. Built Environment

Stakeholders are persons who directly or indirectly have a vested interest in the buildings, their operation and their future outcome (Menassa and Baer, 2014). Stakeholders are also referred those involved in the selected scales and beyond and whose lives, environment or business are affected by the three spatial scales and beyond the adopted constructs (Edum-Fotwe and Price, 2009). Stakeholders to the built environment comprise developers/owners, investors, planners, contractors, engineers, architects, surveyors, operators, users, local authorities, material suppliers, and etc. There are generally two major categories of stakeholders in the built environment, i.e. primary stakeholders and secondary stakeholders. Primary stakeholders refer to individuals or groups that have a legal contractual relationship or involvement to the buildings, while secondary stakeholders are those who are not regularly engaged in transactions but can influence or be influenced by the buildings (Rowlinson et al., 2008). In view of that, stakeholders to the built environment could be very numerous and diversified. To reduce the level of complexity, the study emphasizes only the primary stakeholders whose decisions could directly influence the delivery of sustainability in the built environment.

2.2 Stakeholders vs. Sustainability in the Built Environment

Sustainability in the built environment is a technical pursuit as well as a dialogue of values. It undergoes complex processes which require great effort from multi-disciplinary stakeholders. Owing to different priorities and interests, stakeholders could have varying and even conflicting perspectives on making the built environment sustainable (Menassa and Baer, 2014). The stakeholders tend to make sustainability suit to their particular needs and fit their professions (Goh and Rowlinson, 2015).

As a result, stakeholders with different interests could exert various degrees of influences in determining the extent to which sustainability is implemented in the built environment.

In the meantime, stakeholders perform sustainability in construction voluntarily or involuntarily since they sometimes abide by the rules and regulations to attain the sustainability goals. They are subject to different exposure and pressure in applying sustainability ([Goh and Rowlinson, 2015](#)). It is therefore important to align the diversity of values, opinions, expectations and aspirations among stakeholders to achieve a consensus in the decisions for developing environmentally, economically and socially acceptable solutions for the built environment.

Despite the importance of stakeholder involvement in delivering sustainability, few studies have been carried out to investigate the leadership on driving sustainability into buildings in a holistic approach. Ofori (2007) studied the clients' role in attainment of sustainability in housing in Singapore. Dair and Williams (2006) examined the role of different stakeholders involved in sustainable brownfield development in England. On the other hand, Menassa and Baer (2014) employed a model to assess the roles of stakeholders on sustainable building retrofit decisions. To gain an insight into the leadership of sustainability practice, this paper identifies the key roles for developing sustainable building practices. The level of interest and power of major stakeholders towards sustainability are also examined in the paper.

3. METHODS

Thirty in-depth interviews were carried out in Hong Kong to investigate key roles in driving sustainable development into the built environment. The structure of interviews were semi-structure as it gives a frame of fairly specific topics to be covered in the interview while offering the interviewees some leeway in their responses (Bryman, 2015). Apart from sharing their personal thoughts and experience, the interviewees also served as key informants to provide rich information about the current trends of sustainability in the built environment. Interviewees were asked about their views on the leading roles in sustainability practice. The data was analysed through the inductive approach in which the themes and pattern of analysis are driven by the data. The interviewees were coded in the process of data analysis to ensure their anonymity in the study.

All of the interviewees have an exposure to sustainability in the built environment. As shown in Figure 1, they have 22 years of experience in average and all hold senior or managerial position in the organisations. To avoid overlooking the interests of any stakeholders, the study entailed a variety of professions and background of interviewees, ranging from developers to architects, quantity surveyors, engineers, contractors, facilities managers and building service and technology suppliers.

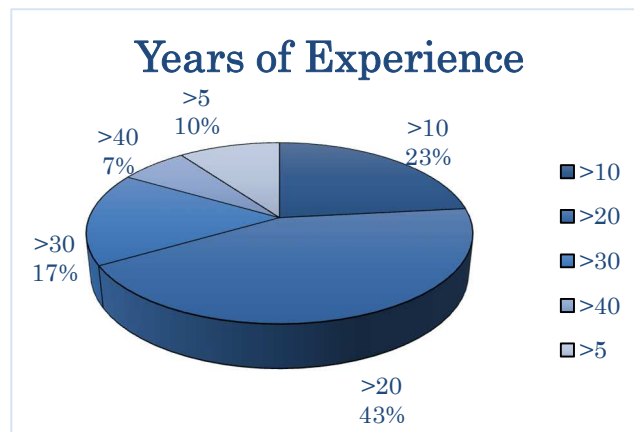


Figure 1. The interviewees' years of experience.

4. RESULTS AND DISCUSSION

The result shows that each stakeholder has his/her roles in bringing impacts on sustainability practice, with varying degrees. Although there are disparities in the opinions of stakeholders, the result suggests that the government and project clients play an extremely important role in the pursuit of sustainability practice. Figure 2 is a tag cloud that articulates the relative prominence of stakeholders in leading sustainability practice in the built environment.



Figure 2. Tag cloud of relative prominence of stakeholders in sustainability practice in the built environment

Almost three quarter of the interviewees recognized the government as the key role in driving sustainability practice into the built environment. The government undertakes several roles by acting as a policy maker, market leader, demonstrator, promoter and financier for sustainability practice. Being the statutory agencies, the government needs to set up the regulatory framework and enact sustainability policies for the physical and living environment of buildings, as indicated by over half

of the interviewees.

“The government has a very strong role because it sets the compulsory practices and guidelines for the industry. If no push is given out to the environment, the industry cannot move further forward.” – E05

“I would say that the Government is the key to set the level playing field for the industry to adopt better practices and to lead by examples. The mandate of the Government is for the common good and sustained future of the people.” – R01

“The government is important particularly in driving the legislation... Clients care about how much benefits they will get. If legislation is enforced, they have no choice...(but) apply sustainability.” – E09

The government should not only introduce sustainability into legislation by enforcing the construction-related laws but also lead the industry to pioneer the innovative technologies in relation to sustainability. A01, A04, R01 and F01 suggested that the government needs to show some examples to the industry by adopting sustainability in their planning, design, procurement, and construction processes. This is in line with Ofori (2007)'s finding which stated that the public client, i.e. the government should provide examples of good practices in the planning, design, construction and management of residential buildings. Besides, the government is also expected to offer more incentives to stakeholders who take sustainability initiatives in the early stage. The interviewees suggested the incentives to be given in the form of gross floor area concession, plot ratio, investment, land allocation and etc.

Apart from the public sector client, private sector clients are also viewed as a critical role in driving sustainability into the built environment. The construction industry in Hong Kong is principally viewed as client-driven and therefore clients are known as one of the most important parties of creating the demand for sustainability. The result shows that clients are normally financier of the building projects and they are positioned at the top of the construction hierarchy. They possess the greatest power to decide whether to embed sustainability in the projects. To initiate moves towards sustainability, clients need to formulate sustainability in the building requirements and allocate budget for sustainable building features. Clients can exert pressure on project participants to adopting green construction and a failure to meet sustainability requirements may result in removal of the concerned parties from the tender list (Qi et al., 2010). This is echoed by the interviewees' comments below:

“The party who has the money has the leading role because sustainable practices need money for the realisation. Without the money, the project cannot pursue sustainable development, no matter how strong a will of client has.” – S02

“In Hong Kong, developers lead the industry because they make initiatives for the development. If developer is encouraged to practise sustainability, the rest of project team will follow. Developer and client are pretty much the same party in Hong Kong...the application (of sustainability) relies on developers to make them happen” – R02

The analysis also indicates that stakeholders at the lower echelon of the construction organisational structure such as contractors and end users are also significant to ensure that sustainability is well embedded in the built environment. Being the implementer, contractors could pose challenges which may eventually decelerate the progress of implementing sustainable construction, according to E04. There is strict adherence to sustainability site plan and requirements to be performed by the

contractors, from material selection, system performance, construction waste management to air quality improvement (Frattarti et al., 2012). Although this view contradicts with [Pitt et al. \(2009\)](#)'s finding, it is supported by [Rowlinson et al. \(2008\)](#) where all the activities in construction cannot be smoothly rolled out without active participation of the main contractor.

End users comprising of owners, tenants, occupants, operators, visitors, public and etc. are also critical because they could give pressure to developers for proactively engaging sustainable buildings. According to E03, end user is the party spent most of the time in the concerned sustainable buildings compared to other stakeholders, thus their engagement is of the utmost importance. End users need to be educated and trained properly to commit towards sustainable built environment.

“If you put up the most sustainable building in the world but not change the habits of people occupied in the building, it is not a complete sustainability. We need to do both things together by providing sustainable buildings and training people inside such as operators, tenants and users”. – S01

In the meantime, some interviewees advocated that everyone has a role in delivering sustainable practice in the built environment. As described by R01, sustainability requires multi-drivers rather than a single driver and it is more lateral rather than hierarchical in structure. A successful application of sustainability requires collaborative effort from all the stakeholders involved. It needs the establishment of sustainability regulatory framework from the government; clear sustainability requirement and goals set by clients, technical expertise and design specification offered by professionals and design team; sustainable materials and solutions configured by suppliers and contractors; and appropriate operation and maintenance manners performed by incoming building users.

5. CONCLUSION

The government and clients are identified as the key roles in leading sustainability practice in the built environment as they possess high decision making power. Nevertheless, the advancement of sustainability in the built environment should not rely on a single party or a particular stakeholder. The realization of sustainability requires collective vision, multiple efforts, dynamic participation and governance of multi-disciplinary stakeholders. The implementation relies on collective decisions, decision making processes, and even the resulting actions of interactions between the stakeholders. Delivering positive change for sustainability in the built environment requires an integrated approach that facilitates skills and knowledge exchange between stakeholders.

Sustainable buildings needs proactive engagement and high commitment of all members. Education and training have to be provided to all involved stakeholders including the public to change their mindset that they are also inevitable parts in making the built environment sustainable. Encouraging sustainability behaviour of stakeholders would therefore be the key to transform current practice in the built environment into more sustainable solutions.

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